**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Confirmation No. 7946

Application No.:     10/676,746

Filing Date:         September 30, 2003

Appellant:           Harold N. Rosenstock

Group Art Unit:      2155

Examiner:            David R. Lazaro

Title:               INFINIBAND   ARCHITECTURE   SUBNET   DERIVED
                     DATABASE ELEMENTS

Attorney Docket:     1400B-000029/US

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Commissioner for Patents
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**BRIEF ON APPEAL**

Sir:

    This is an appeal to the Board of Patent Appeals and Interferences from a final decision of Examiner Lazaro mailed February 6, 2008 and Advisory Action mailed July 25, 2008 wherein claims 1-29 were finally rejected.  A Notice of Appeal was timely filed in the Patent and Trademark Office on July 31, 2008.

## I.       Real Party in Interest

The real party in interest in this matter is Emerson Network Power - Embedded Computing, Inc., having a place of business at 8310 Excelsior Drive Madison, Wisconsin 53717.

## II.      Related Appeals and Interferences

To Appellant's knowledge, there are no related appeals or interferences.

## III.     Status of the Claims

Claims 1-29 are pending in the application and are appealed herein.

## IV.      Status of Amendments

Pursuant to the Advisory Action dated July 25, 2008, Appellant's Amendment submitted on July 3, 2008 has been entered by the Examiner.

## V.       Summary of Claimed Subject Matter

The present application is directed to a method and system for managing INFINIBAND architecture. See, e.g., Application, pg. 4, lines 1-5.

INFINIBAND architecture is an interconnect technology for interconnecting a plurality of nodes to form a system area network. See, e.g., Application, pg. 4, lines 1-5. The INFINIBAND architecture specification sets forth the standards by which INFINIBAND architectures may interconnect. The INFINIBAND architecture specification fails to provide a standard for failover and database replication, leaving it to the various manufacturers of INFINIBAND architecture hardware and software systems to provide such functions. See, e.g., Application, pg. 4, lines 1-5.

An INFINIBAND architecture subnet includes a plurality of nodes (102) that are interconnected with bi-directional links. See, e.g., Application, pg. 4, lines 6-14 and Fig. 1. At least one these nodes includes a subnet manager that manages the routing and various other functions within the subnet. Id. In the claimed embodiment, a subnet manager is provided at a plurality of nodes within the subnet. In situations where multiple subnet managers are provided within a subnet, one subnet manager will include the master subnet manager function (206) and all others will be standby subnet managers (210). See, e.g., Id. and Figs. 1-2. The disclosure is directed to a method and system for passing management control of the subnet from an active

subnet manager to a standby subnet manager, for example, due to failure of the node performing the active subnet manager function.

The node performing the master subnet manager function includes a plurality of database elements, such as event subscription (710), multicast record (712), service record (714) and extended node record (716). See, e.g., Application, pg. 16, lines 17-23. These database elements are replicated at each of the nodes designated as standby subnet managers. See, e.g., Application, pg. 17, lines 21-29. The database elements, as well as the replicated database elements, may be periodically updated to provide for changes in the subnet. Id. In this manner, database elements are available at each of the nodes that are capable of performing the active subnet manager function.

When management of the subnet passes from the active subnet manager to a standby subnet manager, the standby subnet manager assumes the role of active subnet manager and can use the replicated database elements to perform this function. See, e.g., Application, pg. 17, line 30 to pg. 18, line 5. By definition, previously active subnet manager now becomes a standby subnet manager. Derived database elements may then be computed, for example, by a derived database algorithm. See, e.g., Application, pg. 18, lines 27-31. It is important to note that the derived database elements are computed independently from which of the standby subnet managers has assumed the master subnet manager function. Id. In other words, the derived database algorithm determines the derived database elements without considering which of the nodes is actively managing the subnet. Id. In this manner, the derived database elements correspond only to the status of the subnet, irrespective of which of the nodes is performing the master subnet manager function.

Appellant respectfully submits the following tables as a further summary of the claimed subject matter. The tables below include the following information: (i) a verbatim listing of each limitation of the independent claims on appeal, (ii) an identification in the drawings of an example of each limitation as illustrated in the drawings, and (iii) an identification by page and paragraph number in the disclosure of a portion of the specification that discloses each limitation.

| Claim Language | Example in Drawings | Exemplary Reference in Specification |
|---|---|---|
| 1. A method for managing a set of database elements in an INFINIBAND architecture utilizing a plurality of subnet managers, each subnet manager capable of assuming a master subnet manager function, comprising: | "database elements" - FIG. 7, element 752 | pg. 16, lines 21-23 |
| | "plurality of subnet managers" - FIG. 7, element 732 | pg. 17, lines 14-20 |
| | "master subnet manager function" - FIG. 7, element 706 | pg. 17, line 30 to pg. 18, line 17 |
| assuming, by one of the plurality of subnet managers, the master subnet manager function; | FIG. 9, element 906 | pg. 22, lines 16-24 |
| storing the set of database elements in the assuming subnet manager; | FIG. 7, element 708 | pg. 17, line 30 to pg. 18, line 5 |
| replicating the set of database elements in a subnet manager not assuming the master subnet manager function; | FIG. 11, element 1104 | pg. 24, lines 2-6 |
| updating the replicated set of database elements if any changes are made to the set of database elements; and | FIG. 11, element 1102 | pg. 23, line 31 to pg. 24, line 2 pg. 17, lines 21-29 |
| computing derived database elements independent of which of the plurality of subnet managers assumes the master subnet manager function. | FIG. 11, element 1110 | pg. 24, lines 10-15 |

| Claim Language | Example in Drawings | Exemplary Reference in Specification |
|---|---|---|
| 11. An architecture node configured to form at least a portion of an INFINIBAND architecture subnet having a plurality of architecture nodes, a plurality of subnet managers configured to store database elements, and a master subnet manager function, the architecture node comprising: | "architecture nodes" - FIG. 1, element 102 | pg. 4, lines 6-22 |
| | "plurality of subnet managers" - FIG. 7, element 732 | pg. 17, lines 14-20 |
| | "database elements" - FIG. 7, element 752 | pg. 16, lines 21-23 |
| | "master subnet manager function" - FIG. 7, element 706 | pg. 17, line 30 to pg. 18 line 17 |
| a first subnet manager of the plurality of subnet managers capable of assuming the master subnet manager function; and | FIG. 9, element 906 | pg. 22, lines 16-24 |
| a subnet manager function configured to manage the database elements if the first subnet manager assumes the master subnet manager function, generate a replicated version of the database elements if a second subnet manager assumes the master subnet manager function, and compute a derived database elements independently of which of the plurality of subnet managers assumes the master subnet manager function. | "replicated version of the database elements" - FIG. 7, element 730 | pg. 17, lines 24-29 |
| | "derived database elements" - FIG. 7, element 752 | pg. 18, lines 27-31 |

| Claim Language | Example in Drawings | Exemplary Reference in Specification |
|---|---|---|
| 20. A computer-readable medium containing computer instructions for instructing a processor to perform a method for computing a derived database elements in an INFINIBAND architecture subnet a plurality of nodes, the instructions comprising: | "derived database elements" - FIG. 7, element 752 | pg. 18, lines 27-31 |
| | "plurality of nodes" - FIG. 1, element 102 | pg. 4, lines 6-22 |
| assuming, by one of the plurality of subnet managers, the master subnet manager function; | FIG. 9, element 906 | pg. 22, lines 16-24 |
| storing the database elements in the assuming subnet manager; | FIG. 7, element 708 | pg. 17, line 30 to pg. 18, line 5 |
| replicating the database elements in a subnet manager not assuming the master subnet manager function; | FIG. 11, element 1104 | pg. 24, lines 2-6 |
| updating the replicated database elements if any changes are made to the database elements; and | FIG. 11, element 1102 | pg. 23, line 31 to pg. 24, line 2 pg. 17, lines 21-29 |
| computing the derived database elements independent of which of the plurality of subnet managers assumes the master subnet manager function. | FIG. 11, element 1110 | pg. 24, lines 10-15 |

## VI. Grounds of Rejection to be Reviewed on Appeal

The following issues are presented in this appeal:

Claims 1-6, 8-15, 17-25 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over "InfiniBand™ Management Interoperability" by Gregory Pfister, published

January 7, 2003 (hereinafter "Pfister") in view of Kodialam et al. (U.S. Pat. No. 6,778,531; hereinafter "Kodialam").

Claims 7, 16 and 26 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Pfister in view of Kodialam and in further view of "IP over InfiniBand (IPoIB) Architecture" an Internet Draft, December 15, 2001, by Vivek Kashyap (hereinafter "Kashyap").

## VII. Argument

### A. The Rejection of Claims 1-6, 8-15, 17-25 and 27-29 under 35 U.S.C. 103(a) as being unpatentable over Pfister in view of Kodialam.

The Examiner has rejected claims 1-6, 8-15, 17-25 and 27-29 under 35 U.S.C. 103(a) as being unpatentable over Pfister in view of Kodialam. Appellant respectfully submits that independent claims 1, 11 and 20 are allowable over Pfister and Kodialam for the reasons discussed below. For these same reasons, claims 2-6, 8-10, 12-15, 17-19, 21-25 and 27-29 should also be allowable.

#### 1. The Examiner has not established why Pfister should be modified.

Appellant submits that the Examiner fails to explicitly provide a clear articulation of the reasons why the claimed invention would have been obvious to one skilled in the art, as required by the recent Supreme Court case KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385, 1396. The Examiner asserts that "Kodialam teaches a technique computing [sic] derived database elements". See Final Office Action, pg. 5. The Examiner further asserts that "[i]t would have been obvious to one of ordinary skill in the art to use the known technique for computing derived versions of database elements as taught by Kodialam." See Id. The Examiner, however, fails to provide a reason why one of ordinary skill in the art would consider modifying the method of Pfister by further providing derived database elements. Kodialam can be applied only after one of ordinary skill in the art finds a reason to provide derived versions of database to Pfister and when he is further searching for known techniques for computing derived versions of

database elements. The Examiner has not provided such a reason and, therefore, has not established a *prima facie* case of obviousness.

### 2. Pfister teaches away from any modifications.

Pfister teaches that there are two basic ways for maintaining consistent data in an INFINIBAND architecture: keeping the data on shared storage and switching access from a master to standby manager; or replicating the data on separate storage units. Pfister, pg. 7, 5th paragraph. Pfister further explicitly teaches that "it can be said, <u>with a significant degree of certainty</u>, that the two methods outlined above are the <u>only ways</u> to achieve failover without data corruption." Pfister, pg. 8, 3rd paragraph. (emphasis added). In other words, Pfister actually teaches away from any further searching for different methods for maintaining consistent data, because Pfister, the primary reference relied upon by the Examiner, deems it fruitless.

The claimed invention provides a method for consistently managing an INFINIBAND architecture based on database elements. Claim 1 is directed to a method that computes <u>derived database elements</u> independent of the subnet manager that assumes the master subnet manager function, rather than merely using one of the two techniques taught and believed to be the only methods by Pfister. Claims 11 and 20 contain similar limitations. Appellant submits that one of ordinary skill in the art would not consider modifying Pfister to include the technique of computing independent derived database elements as Pfister itself teaches the only two methods it deems to be satisfactory.

### 3. The teachings of Kodialam cannot be combined with Pfister.

Appellant respectfully submits that the Examiner's reliance on the Kodialam reference for the limitation "computing derived database elements independent of which of the plurality of subnet mangers assumes the master subnet manager function" is misplaced. As stated above, the

Pfister reference teaches two alternative methods of achieving failover without data corruption: "shared storage" or "replication." Pfister, pg. 8, 3rd paragraph. These two methods are taught to be alternatives to one another. Id. The Examiner relies upon the discussion of the replication method of achieving failover in Pfister at pg. 8, 1st and 2nd paragraphs, to support the rejection. The Kodialam reference, however, is directed to a method of routing data that utilizes one network management module or system, which is similar to the "shared storage" method of Pfister. See, e.g., Kodialam, column 6, lines 27-36 and column 14, line 46 to column 15, line 10. There is no teaching in the Kodialam reference directed to the replication method as taught by Pfister. The teaching of Kodialam directed to the "shared storage" model cannot be combined with the teaching of the "replication model" in Pfister since Pfister specifically teaches that these two models are alternatives to one another and not combinable.

4.    Kodialam fails to teach "computing derived database elements independent of which of the plurality of subnet managers assume the master subnet manager function" as contended by the Examiner.

As stated above, the Kodialam reference teaches a central manager or "shared storage" model for performing the multicast routing method disclosed therein. As pointed out by the Examiner, Kodialam teaches the derivation of multicast forwarding tables within a router from information stored in a centralized network management system. See, e.g., Kodialam, column 14, line 46 to column 15, line 10. Because Kodialam fails to disclose a change in management function and instead teaches only one central manager, Kodialam necessarily fails to teach the derivation of database elements independent of which of the plurality of subnet managers assumes the master subnet manager function as claimed.

The Examiner acknowledges that the Pfister reference fails to disclose "computing a derived version of the set of database elements independent of which of the plurality of subnet

managers assumes the master subnet manager function." See Final Office Action, pg. 5. The Examiner relies solely on the Kodialam reference for this teaching. As stated above, however, Kodialam cannot teach this limitation since it fails to disclose a switch in management function as claimed.

In the Advisory Action, the Examiner argues that the Kodialam reference teaches such independence because it fails to specifically teach a dependency. See Advisory Action, p. 3. As stated above, the Kodialam reference, to the extent it teaches anything related to this appeal, teaches only the derivation of a forwarding table from the multicast routing tree present in a central manager. See, Kodialam, column 14, line 46 to column 15, line 10. The Examiner does not, and cannot, point to any discussion in Kodialam that teaches the derivation of database elements that is independent of the central manager because Kodialam contemplates only one such central manager. The Examiner must show that the Kodialam reference teaches independence as claimed in order to maintain the rejection and not just that the reference to fails to disclose dependence. Appellant respectfully submits that the Kodialam reference teaches actual dependence in that the derivation of forwarding tables is dependent on the multicast routing tree that is present in the central manager. Furthermore, Appellant respectfully submits that even if the Examiner's assertion is correct and Kodialam fails to disclose any such dependence, the failure of Kodialam to teach dependence is not the same as teaching the independence as claimed.

**B.** **The Rejection of Claims 7, 16 and 26 under 35 U.S.C. 103(a) as being unpatentable over Pfister in view of Kodialam and in further view of Kashyap.**

The Examiner has rejected claims 7, 16 and 26 under 35 U.S.C. 103(a) as being unpatentable over Pfister in view of Kodialam and in further view of Kashyap. The Examiner's rejection of claims 7, 16 and 26 relies upon the rejection of claims 1, 11 and 20, respectively, combined with the Kashyap reference. Appellant respectfully submits that claims 1, 11 and 20 distinguish over Pfister and Kodialam, as discussed above, and also submits that claims 7, 16 and 26, which depend from claims 1, 11 and 20, distinguish over the Pfister/Kodialam/Kashyap combination for the same reasons.

**C.** **Conclusion**

For the foregoing reasons, Appellant respectfully requests that the Board direct the Examiner in charge of this examination to withdraw the rejections.

Please charge any fees required in the filing of this appeal to Deposit Account 08-0750.

**VIII. Claims Appendix**

A copy of the claims involved in this appeal, namely claims 1-29 is attached as a Claims Appendix.

**IX. Evidence Appendix**

None.

**X. Related Proceedings Appendix**

None.

Respectfully submitted,

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## VIII.   Claims Appendix

1.     A method for managing a set of database elements in an INFINIBAND architecture utilizing a plurality of subnet managers, each subnet manager capable of assuming a master subnet manager function, comprising:

assuming, by one of the plurality of subnet managers, the master subnet manager function;

storing the set of database elements in the assuming subnet manager;

replicating the set of database elements in a subnet manager not assuming the master subnet manager function;

updating the replicated set of database elements if any changes are made to the set of database elements; and

computing derived database elements independent of which of the plurality of subnet managers assumes the master subnet manager function.


2.     The method of claim 1, wherein computing comprises the master subnet manager function computing the derived database elements.


3.     The method of claim 1, wherein the derived database elements are identical regardless of which of the plurality of subnet managers assumes the master subnet manager function.

4.      The method of claim 1, wherein computing comprises computing the derived database elements deterministically regardless of which of the plurality of subnets managers assumes the master subnet manager function.

5.      The method of claim 1, further comprising the master subnet manager function initializing the INFINIBAND architecture subnet utilizing the derived database elements.

6.      The method of claim 1, further comprising:

creating the replicated set of database elements at a standby subnet manager;

the standby subnet manager assuming the master subnet manager function;

the master subnet manager function computing the derived database elements; and

the master subnet manager using the replicated set of the database elements and the derived version of the set of database elements to initialize the INFINIBAND architecture subnet.

7.      The method of claim 1, wherein the derived database elements comprises a local identifier assignment.

8.      The method of claim 1, wherein the derived database elements comprises a tree determination.

9.      The method of claim 1, wherein the derived database elements comprises a forwarding table assignment.

10.    The method of claim 9, wherein the forwarding table assignment comprises one of a linear forwarding table assignment and a multicast forwarding table assignment.

11.    An architecture node configured to form at least a portion of an INFINIBAND architecture subnet having a plurality of architecture nodes, a plurality of subnet managers configured to store database elements, and a master subnet manager function, the architecture node comprising:

a first subnet manager of the plurality of subnet managers capable of assuming the master subnet manager function; and

a subnet manager function configured to manage the database elements if the first subnet manager assumes the master subnet manager function, generate a replicated version of the database elements if a second subnet manager assumes the master subnet manager function, and compute a derived database elements independently of which of the plurality of subnet managers assumes the master subnet manager function.

12.    The INFINIBAND architecture node of claim 11, wherein the derived database elements are identical to the database elements and the replicated version of the database elements regardless of which of the plurality of subnet managers assumes the master subnet manager function.

13.    The INFINIBAND architecture node of claim 11, wherein the derived database elements are computed computing deterministically regardless of which of the plurality of subnet managers assumes the master subnet manager function.

14.     The INFINIBAND architecture node of claim 11, wherein the master subnet manager function is configured to initialize the INFINIBAND architecture subnet utilizing the derived database elements.

15.     The INFINIBAND architecture node of claim 11, wherein the replicated version of the database elements is created at the INFINIBAND architecture node, and wherein the master subnet manager is configured to use the replicated version of the database elements and the derived database elements to initialize the INFINIBAND architecture subnet.

16.     The INFINIBAND architecture node of claim 11, wherein the derived database elements comprises a local identifier assignment.

17.     The INFINIBAND architecture node of claim 11, wherein the derived database elements comprises a tree determination.

18.     The INFINIBAND architecture node of claim 11, wherein the derived database elements comprises a forwarding table assignment.

19.     The INFINIBAND architecture node of claim 18, wherein the forwarding table assignment comprises one of a linear forwarding table assignment and a multicast forwarding table assignment.

20.    A computer-readable medium containing computer instructions for instructing a processor to perform a method for computing a derived database elements in an INFINIBAND architecture subnet a plurality of nodes, the instructions comprising:

assuming, by one of the plurality of subnet managers, the master subnet manager function;

storing the database elements in the assuming subnet manager;

replicating the database elements in a subnet manager not assuming the master subnet manager function;

updating the replicated database elements if any changes are made to the database elements; and

computing the derived database elements independent of which of the plurality of subnet managers assumes the master subnet manager function.


21.    The computer-readable medium of claim 20, wherein computing comprises the master subnet manager function computing the derived database elements.


22.    The computer-readable medium of claim 20, wherein the derived database elements are identical to the replicated version of the database elements and the database elements regardless of which of the plurality of subnet managers assumes the master subnet manager function.

23.    The computer-readable medium of claim 20, wherein computing comprises computing the derived database elements deterministically regardless of which of the plurality of subnet managers assumes the master subnet manager function.

24.    The computer-readable medium of claim 20, further comprising the master subnet manager function initializing the INFINIBAND architecture subnet utilizing the derived database elements.

25.    The computer-readable medium of claim 20, further comprising:

creating the replicated version of the database elements at a standby subnet manager;

the standby subnet manager assuming the master subnet manager function;

the master subnet manager function computing the derived version of the database elements; and

the master subnet manager using the replicated version of the database elements and the derived database elements to initialize the INFINIBAND architecture subnet.

26.    The computer-readable medium of claim 20, wherein the derived database elements comprises a local identifier assignment.

27.    The computer-readable medium of claim 20, wherein the derived database elements comprises a tree determination.

28.     The computer-readable medium of claim 20, wherein the derived database elements comprises a forwarding table assignment.

29.     The computer-readable medium of claim 28, wherein the forwarding table assignment comprises one of a linear forwarding table assignment and a multicast forwarding table assignment.

## IX. Evidence Appendix

None.

## X.    Related Proceedings Appendix

None.